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High-Lysine Corn



High-Lysine Corn:

THE ONE-SHOT RATION OF TOMORROW?

Hogs cannot live on hybrid corn alone, but someday they may thrive on unsupplemented high-lysine corn.

Lysine and tryptophan are amino acids essential for high quality protein. Both are deficient in all grains now used as feed. Trying to finish hogs or poultry without a supplement to supply these amino acids would be like trying to build houses without nails.

This fall three seed companies announced that they would have enough seed to plant 18,000 acres of high-lysine corn next spring. This indicates that large-scale production may be closer than the researchers who discovered high-lysine corn had expected.

The high-lysine corn story began over 30 years ago at Cornell University, when scientists found a mutant recessive gene in opaque corn and named it opaque-2. The effect that the gene has on the protein content of corn was discovered only recently.

In 1963, Oliver E. Nelson and Edwin T. Mertz, scientists at the Purdue (Indiana) Experiment Station, were searching for ways to increase protein value of corn. During their research, they discovered that opaque-2 samples had twice the lysine and tryptophan content of normal corn.

Research was partly financed by funds from USDA.

The opaque-2 gene was introduced into several lines of corn, which showed increased protein content—as well as having twice as much lysine and increased tryptophan. The protein content of the high-lysine varieties was from 12 to 15 percent, compared to 8 percent in regular corn.

A level of 15 percent protein is adequate for most young animals; 12 percent suffices for mature animals.

Nutritional effects of high-lysine were then tested on rats and pigs, which gained weight 3.6 times faster than animals fed on normal corn alone. The weight gain on animals tested was similar to animals fed on hybrid corn with a soybean meal supplement.

Other tests indicated that high-lysine corn diets would improve human diets. When used as the sole source of protein for young children, high-lysine corn's value approached that of

skim milk. In some recent tests, South American children suffering with kwashiorkor, a protein deficiency disease, recovered when high-lysine corn was their only source of protein.

Yields of corn crossed with the opaque-2 gene averaged 15 percent lower than regular corn. However, some of the lines did yield the equal of their normal counterparts. With proper selection, it should be possible to develop high-lysine corns to equal the highest yielding lines.

If high-lysine varieties do yield as high or nearly as high as hybrid corns presently grown, some changes can be counted on.

Sale: High-lysine corn will be rated on its protein feeding value, not just on its moisture content. New marketing arrangements will arise so the grower can benefit from the high protein content.

Use: High-lysine corn will compete with soybean meal as feed for hogs and poultry. Hogs and poultry, which consumed 62 percent of the corn fed in 1967, do not manufacture their own amino acid requirements as do cattle, sheep, and goats. Presently soybean meal supplies their lysine needs, and during 1967 hogs and poultry consumed 60 percent of soybean meal fed.

One study projects that if high-lysine corn yields are 94 percent of regular hybrid corn yields, the price of high-lysine to a hog producer would be equal to that of hybrid corn plus soybean meal. If high-lysine yields equal that of regular corn, feed cost savings are projected at 8.8 percent.

No studies on high-lysine effects on the poultry industry have been made.

Consumers: Some food companies are already at work on high protein corn products. Advertising, which is quick to note improvements, can be expected to make the most of lysine. So, hi-protein corn flakes with lysine may well appear.

Foreign diets: In some African and Central American countries, corn is the major food eaten.

Tortillas made from high-lysine corn will supply much needed protein to children, especially those under 4, who need it for brain development.

GROWING AND MARKETING CORN IS BIG BUSINESS

If you farm, there is around a 50 percent chance that you are a corn producer, since about one-half of all farms grow the crop. That also makes you a bigtime employer, helping to provide jobs for 1.2 million others besides yourself.

The employment figure is an estimate of the number of man-years of direct employment created by most of the activities connected with corn during 1967, from making cornpickers to selling corn flakes.

Some other jobs that corn creates: milling, brewing, and other processing which uses corn; railroading, trucking, and shipping to move it; retailing to sell it; Government employment to study and support it—and oh, yes—farming to produce it.

All in all, 1.6 percent of all civilian employment in 1967 was involved in the production, processing, and marketing of the grain.

Percentagewise, corn occupied an even more significant place on the grocery shelf. In 1967, the \$4.7 billion consumers spent on corn products was equal to 4.3 percent of total consumer spending for food and alcoholic beverages.

Adding to this another one-half billion bushels of corn and corn products shipped abroad in 1967, the value of these items totaled \$5.4 billion, around three-fourths of 1 percent of that year's GNP.

Corn also has a significant impact on agriculture itself, since it commands the most cash receipts of any crop.

In 1967, farmers sold about half of the 4.7 billion bushels of corn they raised for grain. Cash receipts from these sales totaled over \$2.6 billion, and accounted for 6 percent of all farm cash receipts. That put corn fourth in rank after beef cattle (25 percent of cash receipts), dairy products (13.5 percent), and hogs (9 percent).

These livestock industries, incidentally, are corn's best customers. Livestock consume the one-half of corn production which remains on farms, as well as four-fifths of all corn sold off farms.

Corn is highly important in Illinois, where, in 1967, sales of corn amounted to over one-fourth of all farm cash receipts. Corn sales also accounted for a significant portion of total cash receipts earned in four other States: Indiana, Iowa, Nebraska, and Ohio.

U.S. SURVEYS ARE "GOVERNMENT INSPECTED"

Every survey you receive from the Federal Government bears a "seal of approval."

The seal is your guarantee that the survey is necessary for conducting the Government's business, and that the survey form is as brief and economical as possible.

The seal that appeared at the top of the January 1969, crop report is typical:

Budget Bureau No. 40-R0007

Approval Expires December 1969.

A similar notation appears on all other SRS crop and livestock surveys, surveys by other USDA and Federal agencies, each Census of Agriculture and of Population. In fact, any form you receive from the Government for the purpose of gathering data ordinarily should bear this notation. (Internal Revenue forms are among a few specific exceptions.)

It signifies that the survey has been approved by the Bureau of the Budget. The Bureau was charged by Congress in the Federal Reports Act of 1942 with over-seeing government surveys.

Ever since, it has been the responsibility of the agency proposing the report to demonstrate satisfactorily to the Bureau that:

—The information to be gathered is needed and will be used;

—The information is not already available elsewhere;

—A survey is the best way to gather the information and is practical to conduct;

—The survey won't place an undue burden on those responding to it;

—the number of questionnaires, items on the questionnaire, and times they need to be answered are kept to a minimum.

Statistical Reporting Service

FLORIDA FREEZE

The freeze of December 16-17, 1968, caused much less damage to Florida oranges than the freezes of 1957 or 1962, according to the Statistical Reporting Service.

SRS conducted two follow-up surveys on January 1 and on January 15, 1969. There was a significant increase in freeze damage to remaining fruit between the two surveys.

The January 15 survey revealed apparent damage on 48 percent of the oranges. This compares with 63-percent damage following the 1952 freeze and 85-percent damage after the 1962 event. Heavier damage rate was noted this year for Valencias than for the early and midseason varieties.

Statistical Reporting Service

REMEMBER WHEN?

After holding out for a generation, candy bars are about to join the ranks of ex-nickel-apiece items such as toll telephone calls, soft drinks, newspapers, and cups of coffee.

When a leading candy company recently dropped its line of nickel chocolate bars, it was surely the beginning of the end of an era. Rising cocoa prices were partly the reason. But costs of processing and delivery also contributed.

Just a few years back, when world cocoa prices tumbled for a season, candy men were able to put more chocolate for the money into their candy bars. Now, the reverse is beginning to happen.

Although 5-cent candy bars (along with packs of chewing gum about the only valuable items still available for a nickel) are not slated to disappear overnight, their share of confectionery consumption is likely to continue to drop.

1 MILLION FEWER FARMS SINCE 1960

The number of U.S. farms has decreased by one million since 1960, according to a January, 1969, survey by

the Statistical Reporting Service. The preliminary 1969 estimate sets the current number at 2,976,000 farms.

Since 1960, the number of farms and the total land in farms have declined steadily, while the average size of individual farms has increased.

There are 1.12 billion acres in all U.S. farms today, compared with 1.18 billion acres at the start of the decade. The average farm size has increased from 297 acres to 377 acres.

Comparing the current number of farms to the January 1968, number, there was a net decline of 3 percent, a smaller change than in most recent years. The number of farms declined from a year ago in all States except Oklahoma, Nevada, Washington, and Alaska, States where there was no net change.

The total land in farms declined about 4 million acres, or less than 1 percent last year. There was a decline in total farmland in all but 20 States.

Statistical Reporting Service

MORE PIGS PREDICTED

The pig crop last year totaled 94.5 million head, 3 percent more than in 1967. Pork production seems headed up again in 1969, with farmers planning to farrow 5 percent more sows in December 1968-May 1969 than in the like period last year. These intentions were reported to SRS as of December 1, 1968.

If the trend in pigs saved per litter continues as expected, the planned hike in farrowings will result in a pig crop of 51.7 million head for December 1968-May 1969.

This would be a 5-percent larger pig crop than we had in the same months last year. The increase will be spread around all regions except the South Central, where farrowing intentions are the same as actual farrowings in the first half of 1968. The biggest increase in farrowing intentions is 6 percent, occurring in both the Western Corn Belt States and the Western States.

Statistical Reporting Service

USDA Survey Shows:

A LARGER INCOME MEANS A LARGER FAMILY FOOD BUDGET

The amount we spent for food last year—over \$100 billion—was nearly 50 percent higher than 10 years ago. Most of this was the result of population growth, which created more mouths to feed. But also at work was the amazing rise in personal income.

In 1959, the median family income, measured in 1967 dollars, was \$6,200. By 1967, the median family income had risen to over \$8,000.

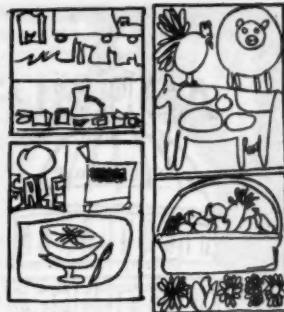
A USDA survey bears out the axiom that the more we make, the more we spend—grocery buying included. People with higher family incomes spend more on food at the grocery store than those with lower incomes, even though they aren't necessarily consuming a greater quantity of food. So the rise in median income has probably resulted in some increase in the average amount that a family spends for grocery foods.

The survey determined how much families with different income levels spent for food. Food spending for use at home per family member increased 1 percent as family income rose 3 percent.

Recent statistics revealed a similar pattern nationally: Between 1959 and 1967, the average amount spent for food per capita rose by one-fourth, at the same time that average per capita income increased nearly one-half.

The boost in retail food spending from rising incomes and a growing population has profited the farmer. About a third of the consumer food dollar represents the farm value of foods.

Also of importance for farmers, the survey found a decided pattern to the kinds of foods which the prospering family buys.



With more money to spend, shoppers choose costlier foods—such as steak instead of hamburgers, frozen peas in cream sauce in place of canned peas.

These choices, made with increasing frequency as income rises, increase the demand for certain costlier fresh forms of food and for more highly processed food items.

As income rises, spending for livestock products—meat, poultry, and dairy products—increases faster than spending for crop products such as fruits, vegetables, and cereals.

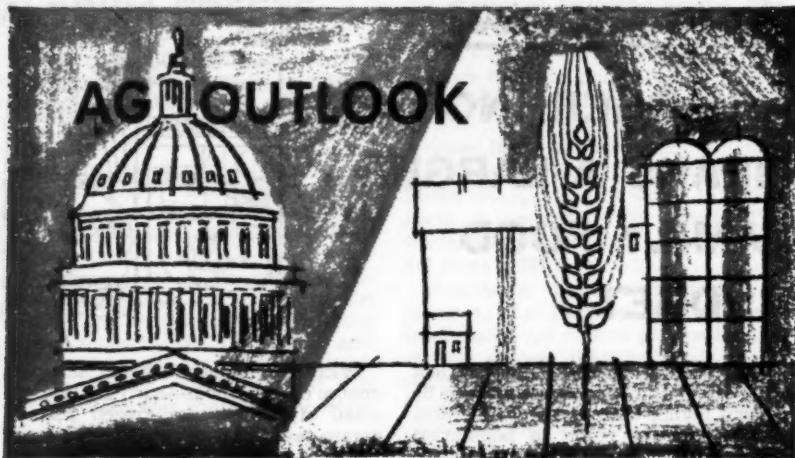
Among livestock products, spending for frozen and fresh forms—such as ice cream, shell eggs, turkey, and the like—increase much more rapidly than spending for canned, dried, or cured livestock foods.

Spending for fresh crop products—which include flour as well as fruits and vegetables—and dried and cured crop foods increased slowly with a rising income level.

However, the value of frozen crop foods in the grocery cart increased very quickly among more prosperous shoppers. Outlays for baked goods also rose fairly rapidly as the income increased.

Even though rising incomes seem to encourage rising grocery bills, Americans aren't spending a bigger part of their incomes on groceries. Incomes have risen so quickly that each year, a smaller fraction of all personal incomes is spent for food. Last year's \$100-billion food bill was a record low 17.2 percent of personal income after taxes.

Stephen Hiemstra
Economic Research Service



AG OUTLOOK

Based on Information Available February 1, 1969

CITRUS SITUATION

Despite December freeze damage in Florida, California, and Arizona, prospects point to a total citrus crop one-third larger than last season's and only 4 percent below the 1966-67 record.

Florida orange production in early January was forecast one-fourth higher than last season's 100 million boxes. Texas and Arizona orange crops are up sharply, and California's was expected to double the 1967-68 level.

Although fruit size is running smaller, tangerine, temple, and tangelo crops are above last season in production, and the grapefruit harvest will be the largest in 21 years.

CREDIT CRUNCH

Farm credit is expected to be harder to obtain this year, especially for smaller-sized operators. Recent increases in interest rates will likely raise the cost of money to borrowers in 1969. Economists say that the gap between farm and non-farm interest rates is narrowing, so future rate changes in the nonfarm sector of the Nation's economy will be more closely mirrored in rates to farmer borrowers.

But there is an additional problem this year: less money to go around. In 1968, there was a surplus of lendable funds in some areas, relative to the amount farmers were able to borrow, even though farm debt increased by a substantial 10 percent.

This year, farmer borrowing will be up again. Farmers will need more credit to buy some of the items they put off purchasing in 1968 in hopes of more favorable interest rates in 1969, and to cover inflation in the price of farm inputs.

Although adequate funds will be available to supply the credit needs of more efficient commercial farmers, smaller-scale farmers may have difficulty getting all they require.

Even last year, when money supplies were adequate for the farm market, financial experts were noting reluctance on the part of institutional lenders to finance farmers on uneconomical size units. In fact, the squeeze was so hard that the Farmers Home Administration, which leads to those who can't get financing on reasonable terms elsewhere, had a larger demand in most States than available funds could satisfy.

WHEAT EXPORT IMPASSE

In the last 6 months of calendar year 1968, exports totaled 301 million bushels, 95 million lower than in that period of 1967. Wheat and flour exports for the 1968-69 marketing year may total only 600-625 million bushels, compared with 761 bushels in the previous marketing year.

Large wheat crops in India and Pakistan, usually the biggest recipients of our aid shipments of wheat, have slowed the export pace. The demand for U.S. wheat in other countries has been reduced because of the presence of a large, well-distributed world wheat supply. Also affecting our exports adversely in recent months were the longshoremen's strike and, to a lesser extent, a temporary suspension of Japanese wheat purchases when quality of earlier shipments was questioned.

Because of the lag in wheat exports, the U.S. carryover on July 1, 1969, is expected to total 700 to 775 million bushels, compared with 537 million bushels last July.

LOWER COTTON CARRYOVER

Although consumption of cotton has slowed this year, the carryover next August, forecast at 6 million bales, is still one-half million below the 1968 level.

Smaller military orders and increased competition from manmade fibers have reduced this year's mill consumption level by 5 percent. At the same time, larger stocks abroad have reduced demand for our cotton, and exports have been down about one-fourth so far this season.

Unlike last year when CCC held almost none of the August 1 carryover, its stocks will total around 2.5 million bales next August. Private stocks, nearly 6 million bales at the beginning of the 1968-69 season, will be whittled down to about 3.5 million bales.

FATS AND OILS PRICES

Edible fats and oils prices probably will remain firm at levels slightly above last fall in coming months. But they would be influenced by a prolonging of the dockworkers strike, which has brought soybean exports to a standstill since late December, and will also be affected by 1969 price support levels for oilseeds (not yet announced).

The CCC has record quantities of 1968-crop soybeans under loan and has acquired cottonseed oil under the price support program. Sizeable soybean exports have materialized, and a new export payment program for lard to the U.K. has been started. Also, domestic demand for soybean oil is at a new high.

LESS WINTER WHEAT

Indications of the winter wheat crop reported by SRS are for a 9-percent reduction from the 1968 crop.

Based on average growing conditions during the rest of the season, the average yield was forecast at nearly 26 bushels per seeded acre on December 1, 1968. That would be 1 bushel more than last year and 3 above average.

Despite the optimistic yield outlook, total production is indicated below a year earlier—1.12 billion bushels, compared with 1.23 billion bushels from the 1968 crop. Seeded winter wheat acreage was down to 43 million acres, 13 percent less than the previous crop.

While wheat acreage is down, rye acreage has expanded a substantial 16 percent this year. Seeded acreage increases were sharpest west of the Mississippi, where a portion of the reduced wheat acreage was seeded to rye. Nearly 4 million acres were seeded, almost up to the average level of the 1963-67

crops. First estimate of rye production will come with the July Crop Report.

HIGHER SEED VALUE

The 1968 crop of 17 grass and legume seeds was smaller than in 1967, but the farm value was a little higher.

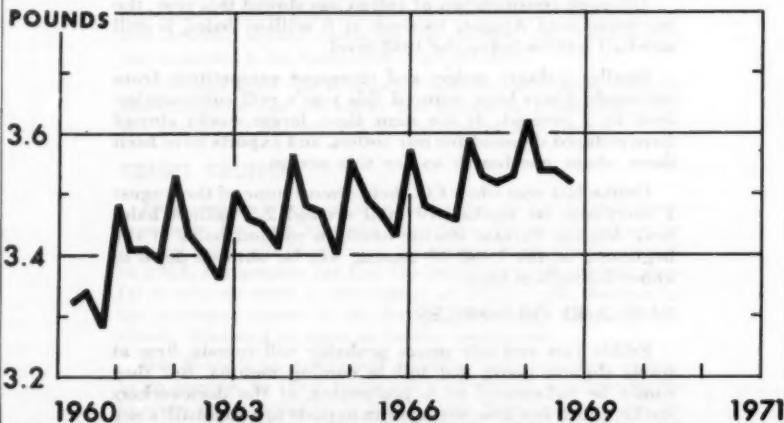
Year end crop reports covering ryegrass, lespedeza, and orchardgrass completed the list of 17 seed crops. Like 12 others, the crop of orchardgrass seed was smaller than in 1967. Ryegrass, lespedeza, ladino clover and tall fescue were the only larger crops.

Total output for the 17 seeds was 514 million pounds, down 2 percent from 1967, and over 100 million pounds below the level of the early 1960's.

The price of alfalfa, the largest legume seed crop, was lower than last year. But prices for all other seeds increased. Total farm value for the 17 crops was \$97 million, compared with \$95 million in 1967.

Statistical Reporting Service

BROILERS: AVERAGE LIVEWIGHT, BY QUARTERS, 1960-68



CHUNKIER CHICKENS. Today's broiler goes to market a few ounces meatier than his predecessor of 1960. The average weight of broilers slaughtered under Federal inspection has increased in 9 of the past 12 years. Economists say that the trend is also responsive to prices: When the price is down, birds are held to heavier weights; when prices go up, they are marketed on the light side. The sawtooth effect in the trend line is due to a seasonal swing in weights from heaviest in fall to lightest in summer.

Economic Research Service

CO-OP CREATES A NEW LOOK FOR OLD BERRIES

Time was when cranberries were available only at holiday time. And then mostly in fresh form for home cooking into the gala goose or turkey dinner.

Cranberries graced the festive board at the first Thanksgiving dinner in Plymouth, circa 1621. Before that cranberries were likely an age-old favorite of North American Indians at harvest time.

Today, although still harvested only in late fall, cranberries are a solid year-round favorite. No longer just available in fresh form, cranberries are canned (sometime mixed with other fruit) as a sauce or jelly, bottled as a juice cocktail, or innovated into convenience packages of muffin or cake mixes.

This past season it has been cranberries galore—some 1.5 million barrels full. In fact, the 1968 crop is a near-record, second only to 1966, and 8 percent above average.

What has helped stretch the tart holiday berry into a desirable year-round grocery item is another American tradition—the farmer cooperative. At least 80 percent of the cranberry crop is marketed through Ocean Spray, a New England co-op. It's headquartered in Massachusetts near the Cape Cod bogs, origin of most U.S. cranberries. The commercial crop also is big in New Jersey and in the northern States of Wisconsin, Washington, and Oregon.

Cranberries are now considered in the class of such old convenience favorites as canned soups and gelatin deserts, according to statements by the Ocean Spray folks in a recent (1962) edition of "American Cooperation", a handbook published annually by the American Institute of Cooperation. The cooperative credits both modern marketing techniques and the traditional U.S. taste for cranberries for their successful achievement. Year-round production and marketing of turkeys also are playing their part.

Because the cooperative must contend with a short one-crop season, and

its prime sales season "breathes down the back" of its harvest time, a bold feature of cranberry marketing is the heavy budget for consumer advertising and promotion. It is the co-op's important item of variable or discretionary expense. Running up to about \$2 million each year, according to the co-op, it pays off well.

Most cranberry marketing boils down to two classes: Seasonal fresh market; and year-round canned products. Because of the short but traditional fresh season, the cooperative concentrates its major effort on the year-round canned products, jelly and juice.

The continuing research into consumer preferences and past performance of the market itself largely shape the form the advertising is to take.

LP GAS USE GROWS

About half of all U.S. farmers are cooking with gas, or using it as a power fuel—and in most cases it's LP gas, made from liquid petroleum and bottled under pressure.

LP gas, according to the annual survey by SRS, was reported used on some 1.5 million U.S. farms in 1968. That figures out to 49 percent of all farms, about the same share as used LP a year earlier. Back in 1963 some 44 percent of the farms surveyed reported using it.

The average price advanced 1.5 percent—about two-tenths of a penny—to 14.7 cents a gallon in 1968. On per-pound purchases, the average price gained 2.5 percent—also two-tenths of a penny—to 8.3 cents a pound.

In the West Central Region, where LP use is greatest, the price on gallon purchases averaged a tenth of a penny lower per gallon than in 1967.

Another important fuel, both on the farm and off, gasoline showed relatively little change, at least through September 15, 1968. Average price per gallon sold from tank trucks ranged from 28.3 cents, where it had been on December 15 a year earlier, up to 28.5 cents on September 15, 1968. And at filling stations the average price per gallon hovered a bit above 33 cents—ranging from 33.1 cents on December 15, 1967 to 33.3 cents on September 15, 1968.

Statistical Reporting Service

TOP CROPS OF 1968

What State was number one in wheat? Who led the way in crop values? What State was top corn producer? A summary of 1968 crop production and values by SRS answers these and other questions about the crop leaders.

Looking first at the total crop picture, last year was a leading one. The index of U.S. crop production was a record high 119 (1957-59=100), 2 percent higher than in 1967. Although acreage of major crops was lower than the year before, yields averaged 3 percent higher.

The value of 78 crops harvested last year was also a record high: \$22.4

Here are the facts and figures on the 15 top crops raised last year, ranked according to the value of total production, and the 3 leading States for each crop ranked according to the amount produced.

Crop	Value (million dollars)	Average yield per acre	Total produc- tion (millions)	Leading producers		
				1	2	3
				(Millions)		
Corn, grain, bushels.	\$4,601.3	78.5	4,374.8	Iowa 901.7	Ill. 901.6	Ind. 416.3
All hay, tons.....	2,806.0	2.0	125.4	Wis. 10.8	Calif. 7.7	Minn. 7.7
Soybeans for beans, bushels	2,617.1	26.6	1,079.7	Ill. 204.4	Iowa 177.9	Mo. 100.6
All wheat, bushels..	1,920.2	28.4	1,570.4	Kans. 243.8	N.D. 213.9	Mont. 125.9
Cotton lint, bales...	1,366.9	(511 lbs.)	10.8	Texas 3.5	Calif. 1.5	Miss. 1.5
Tobacco, pounds....	1,195.0	1,940	1,715.6	N.C. 668.8	Ky. 411.6	S.C. 122.4
Sorghum grain, bu- shels.....	687.0	52.9	738.5	Texas 340.8	Kans. 163.3	Nebr. 103.0
Potatoes, hundred- weight	609.1	213	293.4	Idaho 59.5	Maine 36.9	Calif. 29.6
Oats, bushels.....	556.5	53.5	929.5	Minn. 183.5	Iowa 110.5	Wis. 106.1
Rice, hundred- weight.....	526.8	44.7	105.3	Texas 27.5	La. 26.5	Ark. 24.9
Tomatoes, all, tons.	512.3	15.5	8.0	(1967-68) 5.2	Calif. 0.4	Ohio 0.6
Oranges, tons.....	382.8	5.4	Fla. 4.5	Calif. 0.7	Ariz. 0.1
Barley, bushels....	364.4	43.7	418.2	N.D. 107.7	Calif. 70.3	Mont. 42.7
Sugar beets, tons...	363.5	17.9	25.4	Calif. 6.0	Idaho 3.3	Colo. 2.6
Apples, commer- cial, tons.....	340.6	2.7	Wash. 0.5	N.Y. 0.4	Calif. 0.3

Sheep Industry Seeks New Answers to Old Problems

Sheep's wool, whether three bags or 30 bags full, is not bringing in sufficient returns.

A big part of the problem is the steadily higher cost of wool production. And, U.S. support prices and high protective tariffs, although keeping prices in line with costs, likewise are keeping consumption down.

Another problem is competition from other fibers, domestic and foreign, and from foreign wool. Despite the tariffs, sizable quantities of foreign wool and products take some of the U.S. market.

The National Wool Act stipulated a goal of 300 million pounds of wool a year. But this can be achieved only if efficiency improves.

A basic hindrance to more efficient domestic wool production is the nature of the source: Wool and lamb or mutton are "joint products"—either wool is a byproduct of meat production, or vice versa. Thus, producers specialize in the one at the expense of the other.

U.S. sheep or lamb raisers in the East generally cross-breed their stock to improve conformation and size for meat needs. They pay scant heed to the weight and quality of stock needed for the wool clip.

In the West, only producers in Texas and New Mexico tend to concentrate on sheep for wool. But, in fact, all sheep and lambs can be raised both for conformation and meat quality, and still produce quality wool meeting mill needs.

Although U.S. wool equals basic quality of major wool producing countries, it lacks uniformity and milling quality. U.S. producers who stress lamb for meat production sometimes use improper shearing methods, and have inferior modes of preparing the wool for market. And they often lack information about what the mills want. They also lack incentive to improve clip quality.

Research in dual-purpose sheep production is underway. Results may yet provide the sheep industry with some relief from competitive forces, thus buffering its position as an alternative enterprise.

Some of the crossdrafts churning the trade winds of wool marketing include costs of both producing and marketing

and, importantly, the duality of end use. Marketing currently takes as much as 30 percent of the sheep producer's price—directly or indirectly.

Recent studies point up some basic alternatives which could help most producers increase incomes.

Breeding selection could be more carefully aimed at improved quality for market demand, without reducing yield or lamb quality. Shearing could be improved by separating tags and crutchings, avoiding double cuts (these might be entirely eliminated if chemical shearing catches on), using scourable branding paints, and by segregating black from white-face flocks.

Then, more efficient marketing could result from producers setting up or improving existing wool pools, setting goals to help long-range problems such as availing themselves of storage and marketing services at local warehouses to pool consignments, for storing cuttings, as well as for grading, coretesting, and obtaining price and other market information.

Another boon to producers would be to work with already established farm organizations to increase grower membership. Thus, producers would gain more leverage in sharing the costs and the experiences needed to improve the entire operation.

*Charles A. Odell
Economic Research Service*



EXPORT OUTLOOK TO 1980:

Bigger Feedgrain Volume; Foodgrain Slowup

Grain exports are vital to American producers. Today, thriving export markets consume:

- 60 percent of U.S. wheat production;
- 60 percent of the rice crops;
- and 15 percent of the major feedgrains.

In the near future, though, our grain exports are headed for a period of uncertainty and readjustment. (See the article on page 13.) The Economic Research Service foresees a slowdown in the growth of wheat and flour shipments, a reversal for rice, but new records for feedgrain exports, as a result of the changing forces of world demand.

The ERS projections necessarily make some assumptions about future conditions:

- Continuation of the present world trade climate affecting our exports;
- Return of normal Middle-eastern trade relations and the absence of a large new conflict in the world;
- Additional economic growth in the developing nations which buy our food exports, and the avoidance of another famine such as the Indian harvest of 1965-66;
- Continuation of our current Public Law 480-type programs.

Bearing these "ifs" in mind, here are the particulars of the ERS projections of our future grain exports.

WHEAT. Wheat and flour exports aren't going to exhibit much growth in the short term. By 1973-74, 5 years ahead, the projected wheat and flour exports will total 21.5 million metric tons, compared with 20.4 million tons in 1967-68, or the record 23.1 million tons in the 1963-64 season.

Exports to India and other South Asian countries will drop sharply as agriculture in that region improves. Offsetting this drop, the Japanese market will continue growing, and a host of smaller African and Latin American customers gaining new buying power, will increase purchases of American wheat.

The longer range outlook is for gradual growth in wheat exports. By 1980, they may total 25 million metric tons—one-fifth higher than last season.

However, the world wheat market will probably continue to be burdened with surplus supplies. Major wheat exporters have been producing record-breaking crops, and many countries are going to be more self-sufficient in producing their own foodgrain needs.

RICE. U.S. rice exports increased spectacularly from 1.2 million metric tons in 1962 to 2.3 million tons in 1968. But that record may stand for a few years. Rice exports are expected to taper back to 2 million metric tons in the next 5 years, with little improvement in store through 1980.

Many of today's biggest rice importers will improve their own rice production with new technology, to the point where self-sufficiency is reached. Although gains may be relatively small at first, the Food and Agricultural Organization of the U.N. has estimated that by 1985 India and Pakistan, rice-poor today, may be important rice exporters.

FEEDGRAINS. The level of U.S. feedgrain exports in 1974 and 1980 will depend on sales to our two largest customers: The EEC and Japan.

The EEC will continue to need more feed than it can grow to support the rising livestock consumption of member peoples. Japan, which already uses its land to the fullest, will have to import nearly all of the additional feed it will require in the future. Japanese meat consumption is very low by our standards, and incomes have been rising steadily and rapidly, so large increases in meat production and feedgrain imports seem certain.

Rising incomes elsewhere, leading to new demand for meat and livestock products, are also in store. The feedgrain needs of Eastern Europe, Asia, and non-EEC Western Europe are expected to increase, resulting in bigger U.S. exports to these areas.

In 1967-68, we exported a total of about 20 million metric tons of feedgrains. By 1973-74, exports may total 30 million tons, and by 1980, over 40 million tons. However, the competition for feedgrain trade from Argentina, Australia, and South Africa, will be much more intense in the years ahead.

*Quentin West
Economic Research Service*

The Grain Export Climate Changes Rapidly

The postwar climate has been ideal for the growth of our grain trade.

Instrumental have been rapid population growth in the less-developed countries, bad crop years in Russia and India during this decade, and the growth of new food and feed markets in industrialized nations such as Spain and Japan.

In this climate, exports have frequently enjoyed rapid growth. Wheat and flour and feedgrain exports have doubled since 1958, while rice exports doubled since only 1963.

But even as we enjoy the fruits of good weather, some clouds are appearing on the export horizon. New forces affecting our grain trade are emerging and the climate is in a state of change.

For example, the outlook on the twin problems of too many people and too little food is undergoing a rapid swing, from talk of the "population bomb" to news of technological breakthroughs in both population control and food production in the less-developed countries.

Because these technologies are so new, however, it may take years for concrete and permanent effects to gel. Meanwhile, we'll likely be faced with spectacular gains and setbacks in both areas.

Although many governments have begun campaigns to curb the growth rate in their countries, the results so far have been uneven.

In Chile, Hong Kong, and several other nations, the number of births per 1,000 has fallen below the level of 1960. In others like Ceylon, less dramatic slowdowns in the birthrate are occurring. But in the crucial population giants such as Brazil, Pakistan, or India, there are no clear measurements of the net effect of population programs.

Growing food output in the developing countries may eventually offset the pressure of population growth.

Improved farm inputs such as fertilizer and high-yielding seeds can have a large and immediate impact on the food supply. For example, introduction of high-yielding rice in Southeast Asia this year will boost production by an estimated 7 percent.

A dramatic gain can also prove to be a real strain on a primitive system of farming and food distribution. The introduction of a high-yielding crop creates new problems in the areas of disease control, fertilization, irrigation, harvesting, storage, and distribution.

In the long run, the new farm technology will mean a greater degree of self-sufficiency for the underdeveloped world. Although this will reduce the demand for our foreign aid, it will strengthen the demand for some of our commercial food exports.

Greater self-sufficiency in agriculture usually results in a much stronger national economy and better incomes. As people are better able to afford the quality and quantity of food they desire, food consumption per person increases, and demand for imported food goes up.

In addition to the effects of population and food supply trends, our grain trade will continue to reflect changes in the meteorological and political climates.

As always, the least predictable force is the weather. Crop failures in Russia in 1963 and 1965, for instance, led to large grain imports by the U.S.S.R. In the following 3 years, in contrast, the weather did a turnaround, and the import level dropped sharply.

The political climate can be just as capricious as the weather, as recent events have shown. Because of the aftermath of the Arab-Israeli conflict, U.S. grain shipments to several countries in North Africa were halted last year and total U.S. wheat and flour shipments to Africa dropped by half.

Food assistance programs have had a primary role in the size of our grain exports. Massive aid to traditional receivers such as India may taper down in the next 10 years, as these countries consolidate their food production gains. At the same time, with all the uncertainties that cloud the outlook for the world food situation, it's probable that U.S. aid exports will continue at something like their present level.

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Synthetics Take The Starch Out Of The Industrial Outlets For Grains

This article, which examines the challenge posed to natural starch sources by synthetics, is the first of a series that will explore the impact of new products on agricultural markets. Some of these products are "man-mades" such as synthetic starch, but others, like soy protein, are agricultural in origin.

Although they're not covered with cream or sprinkled with raisins, many industrial products are made from the same grains as our breakfast cereals. The starches in paper, oil muds, textiles, gypsum board, and other products are made from corn, wheat, and other grains.

Recently, however, synthetics have been coming more importantly into view. In fact, of the nearly 5-billion pounds yearly of all materials going into such products, about one-third is now synthetic.

Corn and sorghum are the major natural sources for industrial starch markets, largely for paper or paper products. Cereals also are important sources for textiles, gypsum board, and adhesives. And paper takes over 2.1 billion pounds. But if cereals account for the lion's share, synthetics now contribute an important 32 percent.

Synthetics have been making much headway as material sources for these markets. Adhesives, for example, next most important industrial outlet for cereals tell an even more impressive story—some 60 percent of adhesives is synthetic-based.

The immediate thought is that synthetics are cheaper. Not so. In 1967, synthetics averaged twice the price of cereals for these uses. Cereal prices average from 4.8 cents a pound to 6.3 cents; synthetics from 36 cents through 43 cents a pound. Growing popularity of synthetics is from technical advantage, not from price.

Actually, wheat commands a premium price for few industrial uses. One is in wallpaper paste, another is as an extender in adhesives. Strangely, this last is the top industrial use of wheat, as an extender for a synthetic—urea formaldehyde, used for composing adhesives.

Much of the wheat finding its way into industry is low-grade or damaged, and otherwise would be abandoned. It's mostly used as flour or starch, coproducts in processing gluten. Some 6 to 8 million bushels of otherwise useless wheat flour account for this market.

Because the top wheat use is in adhesives that are used mostly for laminating plywoods, changes in such wheat use would be tied to advances or declines in industrial laminating uses.

Corn wet milling production is the major source today of some 80 percent of U.S. industrial starch. Changes in this use depend less on the cereals' technical qualities than on the changes in U.S. gross national product, which such use parallels.

Most of the industrial market for starch and flour is taken by corn. But, as starches go, industrial use takes a relatively small share of all grains—under 3 billion pounds of the multibillion bushel grain production.

Interestingly, shipments of corn starch to industrial uses rather than for foods have grown apace—from 67 percent of the shipments in 1950 to some 90 percent by 1966.

Cornstarch markets have grown at an average 3.3 percent rate to only 0.6 percent for wheat flour markets. Industrial chemicals are a multibillion pound outlet for starch products, still growing rapidly. Here's one market where the price advantage of corn starch over synthetics is expected to expand the use of the cereal product.

But, in textiles, industry has leveled off to 300 million pounds annually. A stunting influence in view for cereals use in textiles, is the unfortunate ability of starches to pollute the mills' water supplies. At least half the biological oxygen demand of such mill waste stems from starch.

Recently, however, the ability of non-degradable detergents to pollute the waters seems to have cushioned some of the backlash against starch use. Costs of starch plus treatment for its waste, is less than the costs of appropriate synthetics.

Although total view of industrial outlets for cereal starch have shown a 300-percent gain in the past 30 years, developments in producing plastics, fibers, ceramics, glass, metals, and resins seem to favor synthetics over natural ingredients.



SAM STAT SAYS

"Check My Data"

A brief roundup

■ **Increased Productivity:** Number of hired farm workers averaged 5 percent less for the year in 1968 and 12 percent below 1966. ■ **Waxing Wages:** Annual composite hourly farm wage rate in 1968 averaged \$1.21, gaining 8 percent over 1967. The gain was the same for rate per hour without prerequisites at \$1.43. ■ **Crammed Cranberries:** Yields averaged about the densest ever for cranberries—72.4 barrels per acre—in 1968. That's 5 barrels per acre ahead of 1967 and 4.8 barrels better than average. ■ **Pay Less, Use More:** 1968 farm electricity at \$2.15 per kw.-hr., averaged 2 cents less than in 1967 and 26 cents below a decade earlier. But the bills in 1958 averaged \$11.20, and in 1968 they averaged \$17.59. ■ **Prospects for planting 1969 winter spinach for processing are down a big 22 percent from 1968 planted acreage, and 24 percent from 1967.** Although decreases are for both canning and freezing spinach, most of the drop is in acreage for freezing. ■ **Despite the drop in winter spinach for processing, production of major winter vegetables is up 10 percent above last year.**

DON'T SAY ORANGES, SAY VITAMIN C

What kind of a nutritional year will 1969 be for Americans? What vitamins and minerals will increase or be diminished in their diets?

Based on taste trends and expected supplies of various foods, the level of ascorbic acid (vitamin C) will rise, for example, because of expected gains in supplies of citrus.

Another rise is likely in supplies of meat, which

will mean more iron and thiamine (vitamin B 1) available in U.S. diets.

On the other hand, there's likely to be a loss of calcium intake, because of reduced use of some dairy products—a prime source of calcium in diets.

Since 1900, calcium levels have risen, but currently they are down from a generation ago. Most of the decline since 1947-49 has followed the decline in dairy products. However, somewhat less calcium has been taken through consumption of vegetables and fruits, and grains.

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Nevertheless, the gain since 1909-13 in use of dairy products other than butter has been high enough to raise dairy's total contribution of calcium to the diet from two-thirds to three-fourths.

We've been taking in less Vitamin A than we did a decade ago. Although the level has been fairly steady over recent years, it is 4 to 5 percent lower now than in 1957-59. Most of the reason is because of decreases in consumption of dark-green and deep-yellow vegetables and especially sweetpotatoes.

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